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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/838,621	04/19/2001	Georgios B. Giannakis	1008-001US01	3586

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EXAMINER

KIM, KEVIN

ART UNIT	PAPER NUMBER
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2634

DATE MAILED: 08/20/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

Application No.

09/838,621

Applicant(s)

GIANNAKIS ET AL.

Examiner

Kevin Y Kim

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 19 April 2001.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-33 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-3, 8-15, 18-33 is/are rejected.
- 7) ☒ Claim(s) 4-7, 16 and 17 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 19 April 2001 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_.
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_.

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### DETAILED ACTION

#### *Claim Rejections - 35 USC § 112*

1. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

2. Claims 11-13, 19, 23-25, 31 and 33 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claims 11, 19, 23 and 31 recite "K+L rows" but what "K" represents is not defined.

However, in light of similarly worded claim 4, "K" is interpreted as the number of symbols in "the block of symbols."

Claims 12, 13, 24, 25 and 33 are rejected for the same reason by dependency.

#### *Claim Rejections - 35 USC § 102*

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

4. Claims 1-3, 8, 9, 21, 22, 26-30 are rejected under 35 U.S.C. 102(e) as being anticipated by Kaiser et al (Us 6,188,717).

Consider claim 1. Referring to Fig. 9a, Kaiser et al discloses a communication method, comprising the steps of

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a) "applying a spreading code to a block of information-bearing symbols to form a set of chips for each symbol," at col.8, lines 33-36 describing multiplying a spreading code to a block of 24 symbols. A set of 8 chips are formed for each symbol.

b) "selectively interleaving the chips from the chip sets," at col. 8, lines 40-42 describing 192 chips from 24 chip sets are selected and interleaved.

c) "generating a transmission signal from the interleaved chips," at col.8, lines 42-43.

Regarding claim 2 calling for the spreading code to have "an orthogonal spreading code," see the Abstract of Kasier describing the use of orthogonal spread sequences.

Regarding claim 3 calling for "a wireless communication medium," see Field of Invention at col. 1 describing radio communication, which is "wireless."

Regarding claim 8, Fig. 9b shows a receiver for "receiving the signal" and "de-interleaving the chips from the received signal" (45).

Regarding claim 9 calling for "separating the data according to a user," interpreted as a despreading, the maximum-likelihood sequence estimator block (46) in Fig. 9b performs the despreading, which separates data from a spreading code uniquely assigned to a user. See patent claim 27.

Consider claims 21,28, 29. Referring to Fig.9a, Kaiser et al discloses a transmitting device comprising "a block spreading unit" ((37) to form a set of chips for each symbol" at col.8, lines 33-36 describing multiplying a spreading code to a block of 24 symbols. A set of 8 chips are formed for each symbol. Because 24 sets of 8 chips are interleaved, "the chips from different sets are interleaved" when the 192 chips are interleaved. "a pulse shaping unit to

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generate a transmission signal from the stream of interleaved chips" is shown at block 41. Fig.9b shows a receiver for receiving the signal and de-interleave the chips.

Regarding claims 22 and 30, although the details of the interleaver is not described, a buffer or memory that can read in chips in column wise and read out in row wise is an inherent element of an interleaver. In addition the Abstract of Kaiser describes the use of orthogonal spread sequences

Regarding claim 26 calling for "user-specific orthogonal spreading code," see Kaiser at Abstract describing the use of orthogonal spread sequences. Since a distinct spreading code is used for each user, it is "user-specific."

Regarding claim 27 calling for "a cellular phone," see col. 4, lines 46-52 teaching that the communication apparatus is used in a cellular network, i.e., it is a cellular phone.

### ***Claim Rejections - 35 USC § 103***

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. Claims 10, 20 and 32 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kaiser et al, as applied to claims 9, 18 and 28 above respectively, in view of Fugawa (US 5,757,845).

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Kaiser et al disclose all the subject matter but fails to describe "applying a matched filter" in claims 10 and 20 and "a single-user detector to apply a matched filter." However, the use of a matched filter for despreading a direct sequence spread signal is well known in the art for its high speed and tracking capabilities as evidenced by Fugawa. See Abstract and Fig. 1. In addition, the deinterleaver (45) shown in Fig. 9b is "a block separator" to produce a streams of de-interleaved chips. See the decoder (49) and symbol demapper (47) for "a single user decoding technique" in claim 10 and "a single-user channel equalization and symbol detection scheme" in claims 20 and 32. Thus, it would have been obvious to one skilled in the art at the time the invention was made to apply a matched filter in Kaiser's receiver for despreading the received spectrum spread signal since it is a well known method of despreading for its high speed and tracking capabilities as taught by Fugawa.

7. Claim 14, 15, 18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kaiser et al (US 6,188,717) in view of Sourour et al (US 6,377,615).

Consider claims 14 and 18. Kaiser et al discloses all the subject matter claimed, as explained in connection with claims 1 and 8 above respectively, except that a computer-readable medium having instructions to cause a programmable processor to perform all the steps of the communication method. Sourour et al teaches functions such as spreading and interleaving can be implemented by a programmable processor running computer program instructions. See col. 6, lines 22-39. Thus, it would have been obvious to one skilled in the art at the time the invention was made to provide a computer-readable medium having instructions to cause a programmable processor to perform all the steps. For the same reason, a computer-readable medium claimed in

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claim 18 for receiving the interleaved chips and deinterleaved the chips would have been obvious.

Regarding claim 15 calling for "a wireless communication medium," see Field of Invention of Kaiser et al at col. 1 describing radio communication, which is "wireless."

***Allowable Subject Matter***

8. Claims 4-7, 16 and 17 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

9. Claim 11-13, 19, 23-25, 31 and 33 would be allowable if rewritten to overcome the rejection(s) under 35 U.S.C. 112, 2nd paragraph, set forth in this Office action and to include all of the limitations of the base claim and any intervening claims.

10. The following is a statement of reasons for the indication of allowable subject matter: no prior art has been found to teach or suggest a chip interleaving method or device wherein the chips forms from K symbols are interleaved in an array of M columns and K+L, where L is a function of the communication channel length.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Kevin Y Kim whose telephone number is 703-305-4082. The examiner can normally be reached on 8AM --5PM M-F.



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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Stephen Chin can be reached on 703-305-4714. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

kvk

  
CHIEH M. FAN  
PRIMARY EXAMINER

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